

SIMPLE ERROR-CORRECTION CODES FOR DATA BUFFERS

Lih-Jyh Weng et al.

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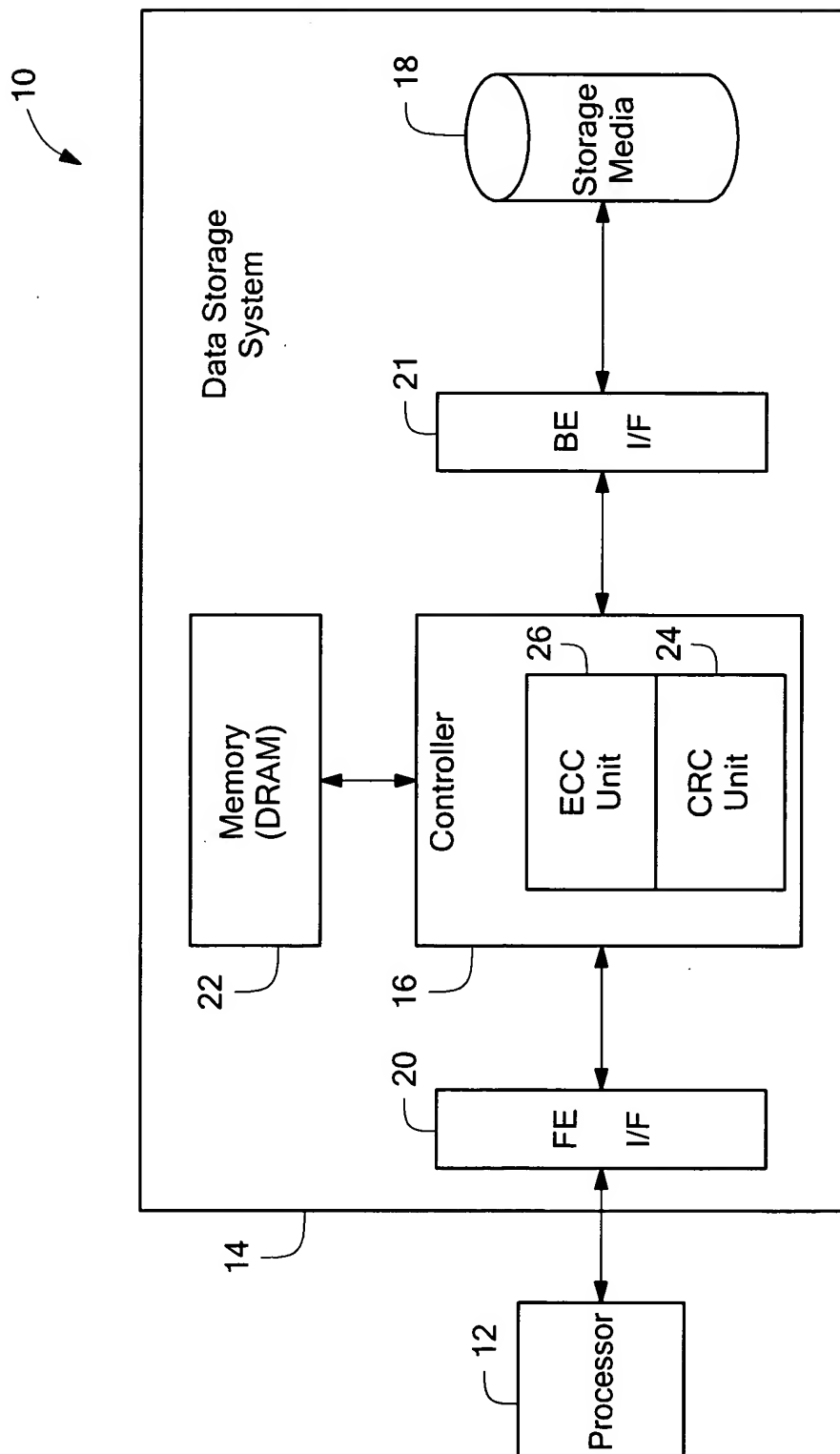
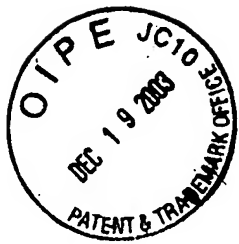


FIG. 1



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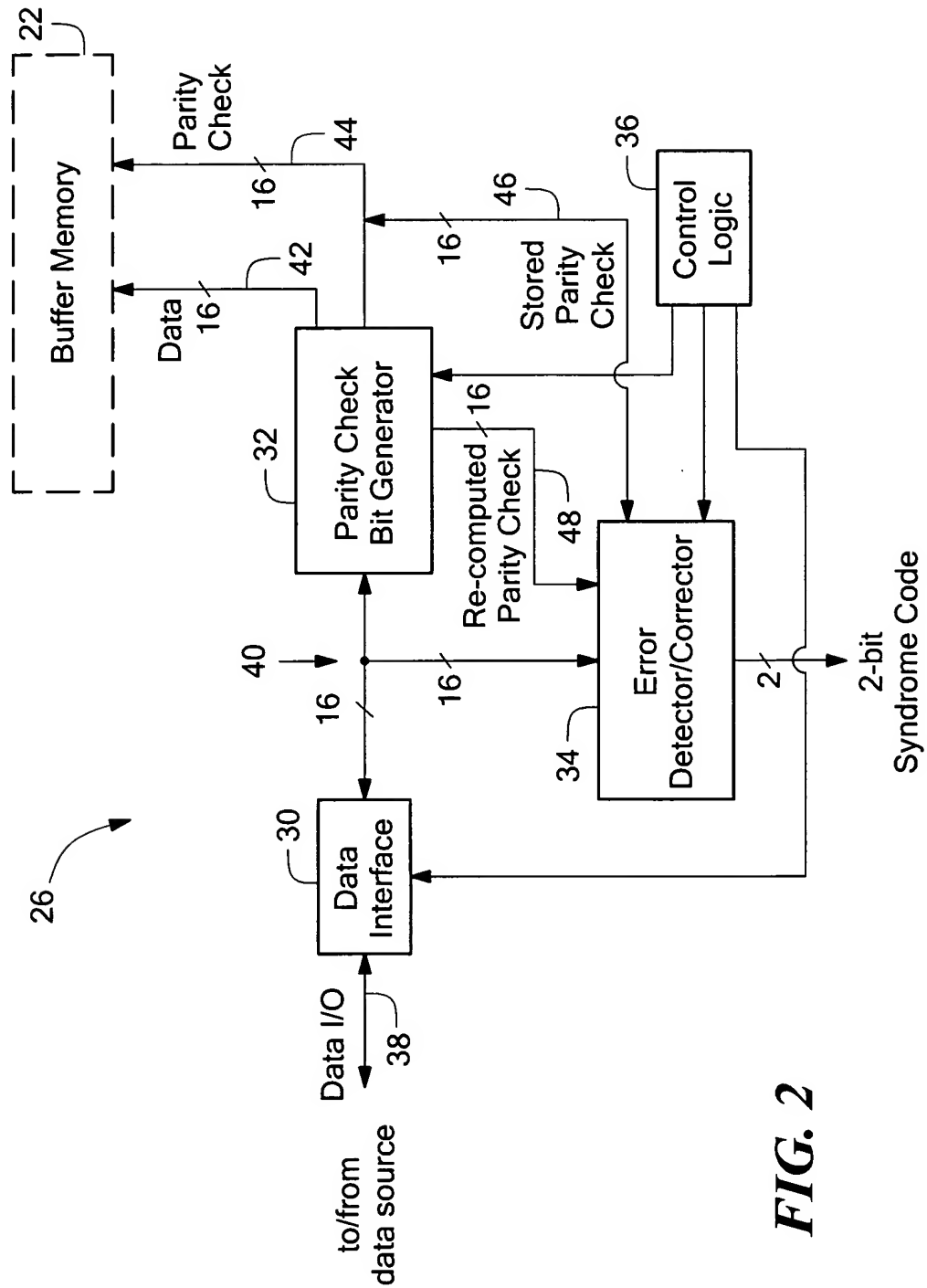
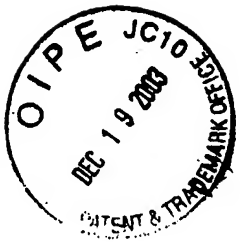


FIG. 2



SIMPLE ERROR-CORRECTION CODES FOR DATA BUFFERS

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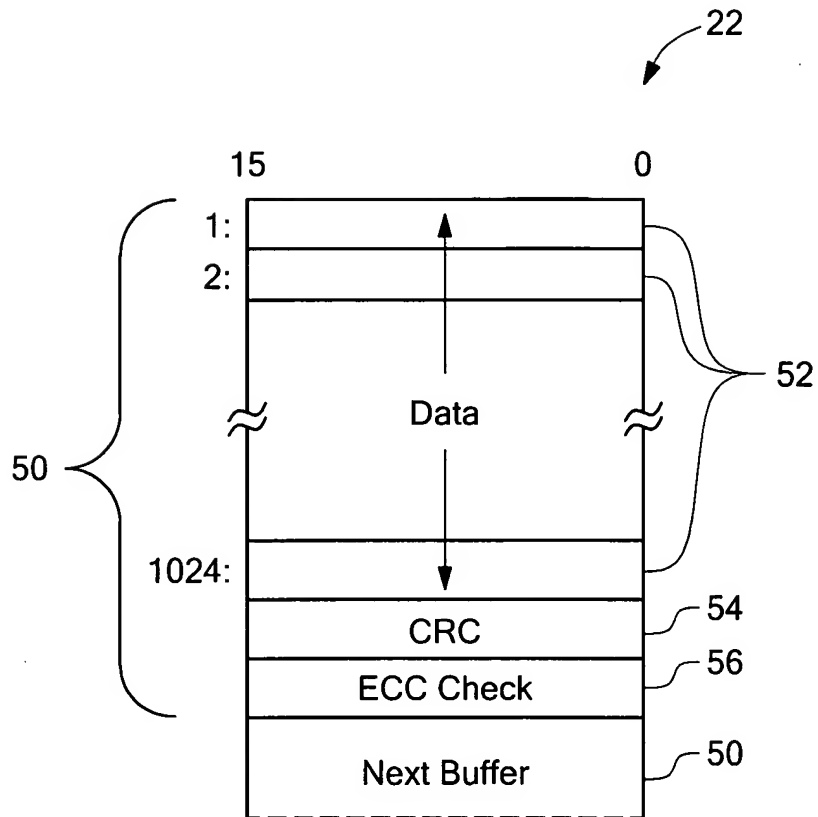
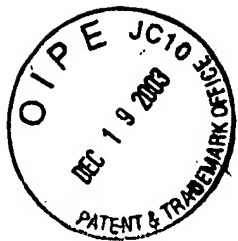


FIG. 3



SIMPLE ERROR-CORRECTION CODES FOR DATA BUFFERS

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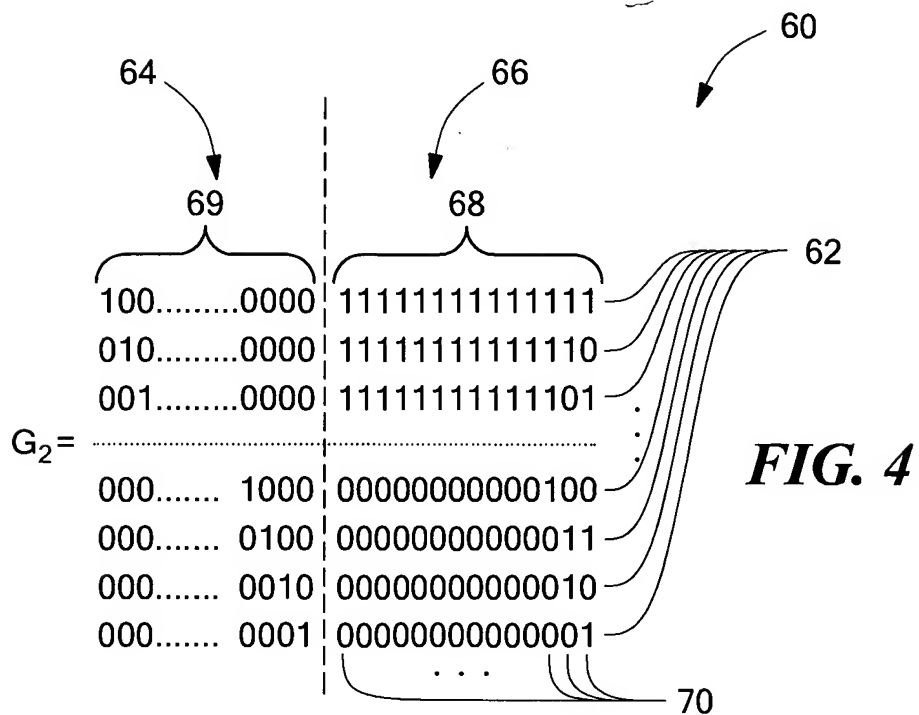


FIG. 4

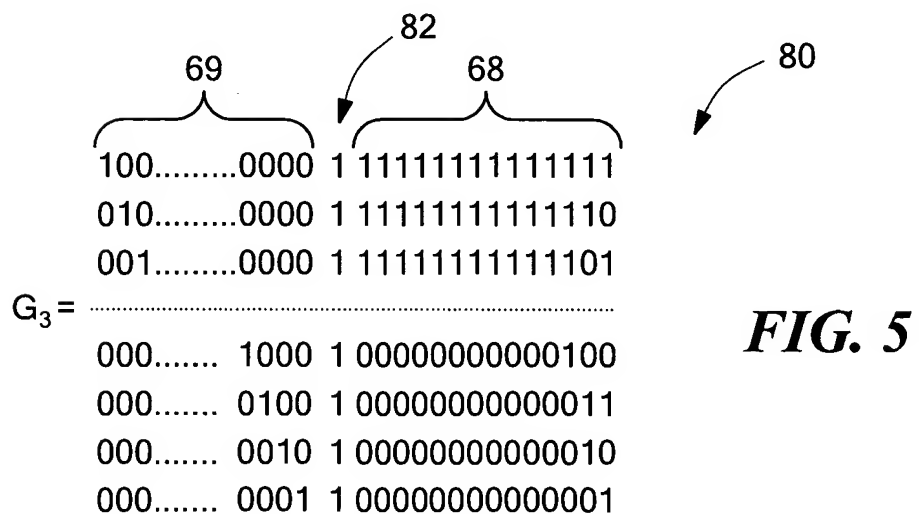


FIG. 5

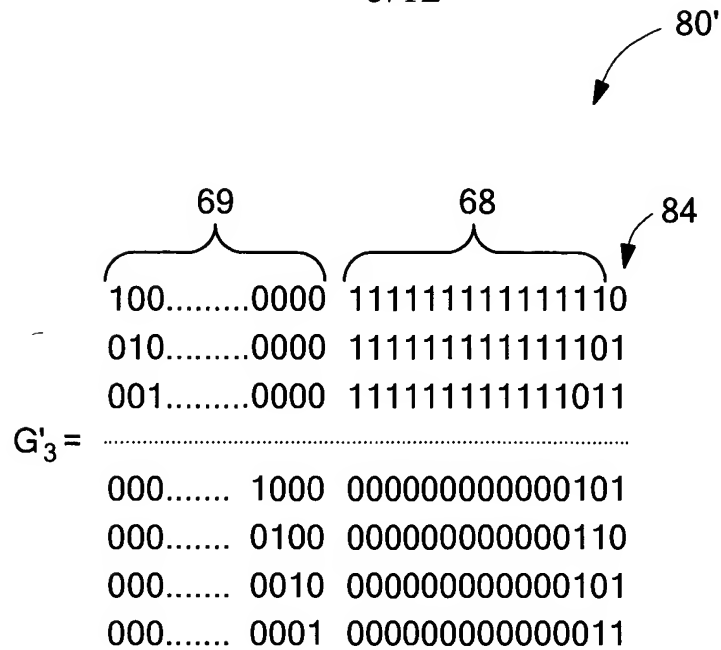
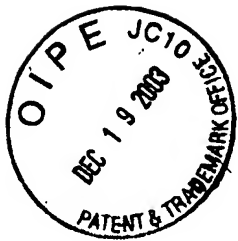


FIG. 6

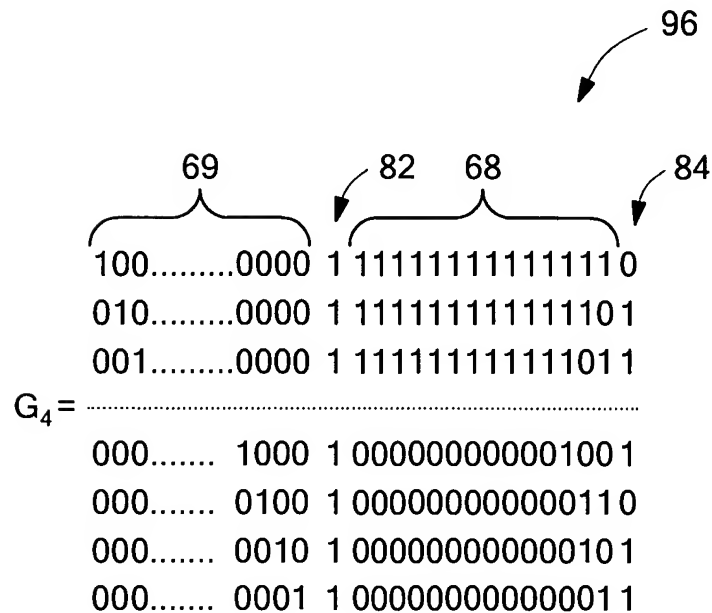


FIG. 7

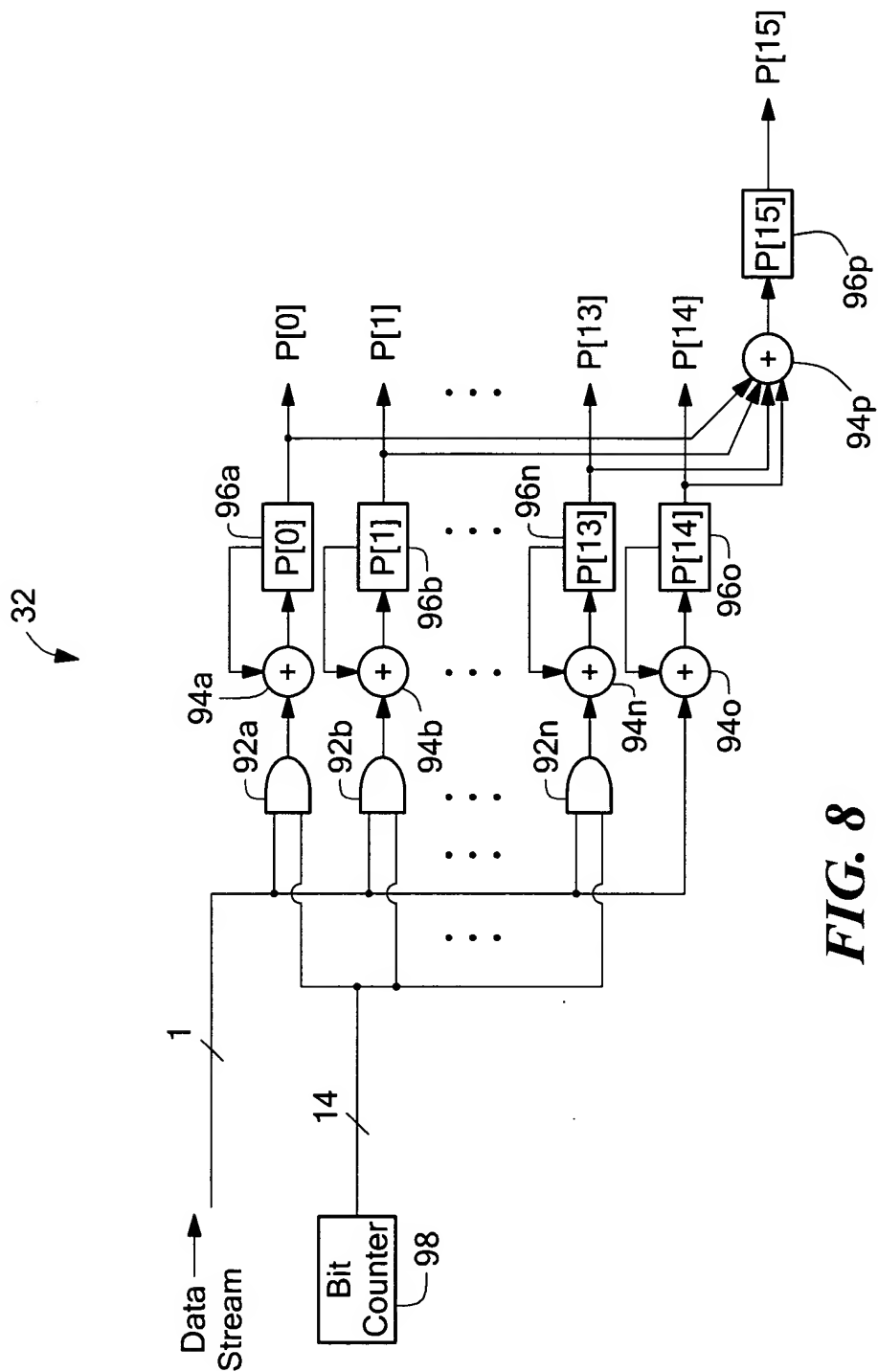
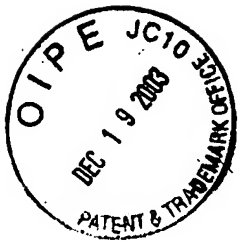
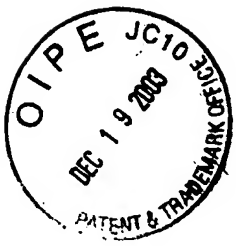


FIG. 8



SIMPLE ERROR-CORRECTION CODES FOR DATA BUFFERS

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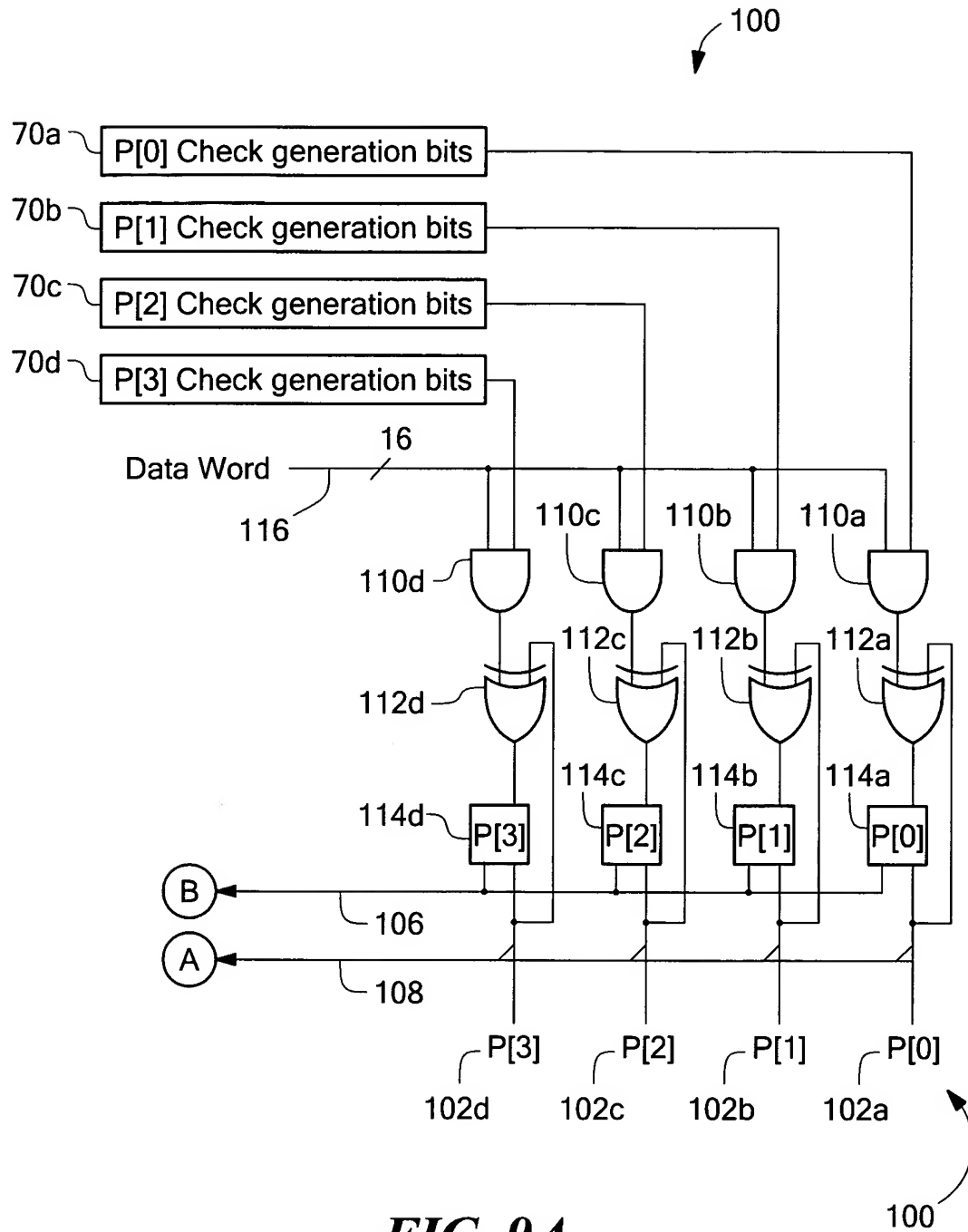
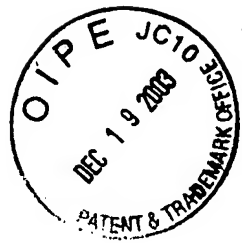


FIG. 9A



SIMPLE ERROR-CORRECTION CODES FOR DATA BUFFERS

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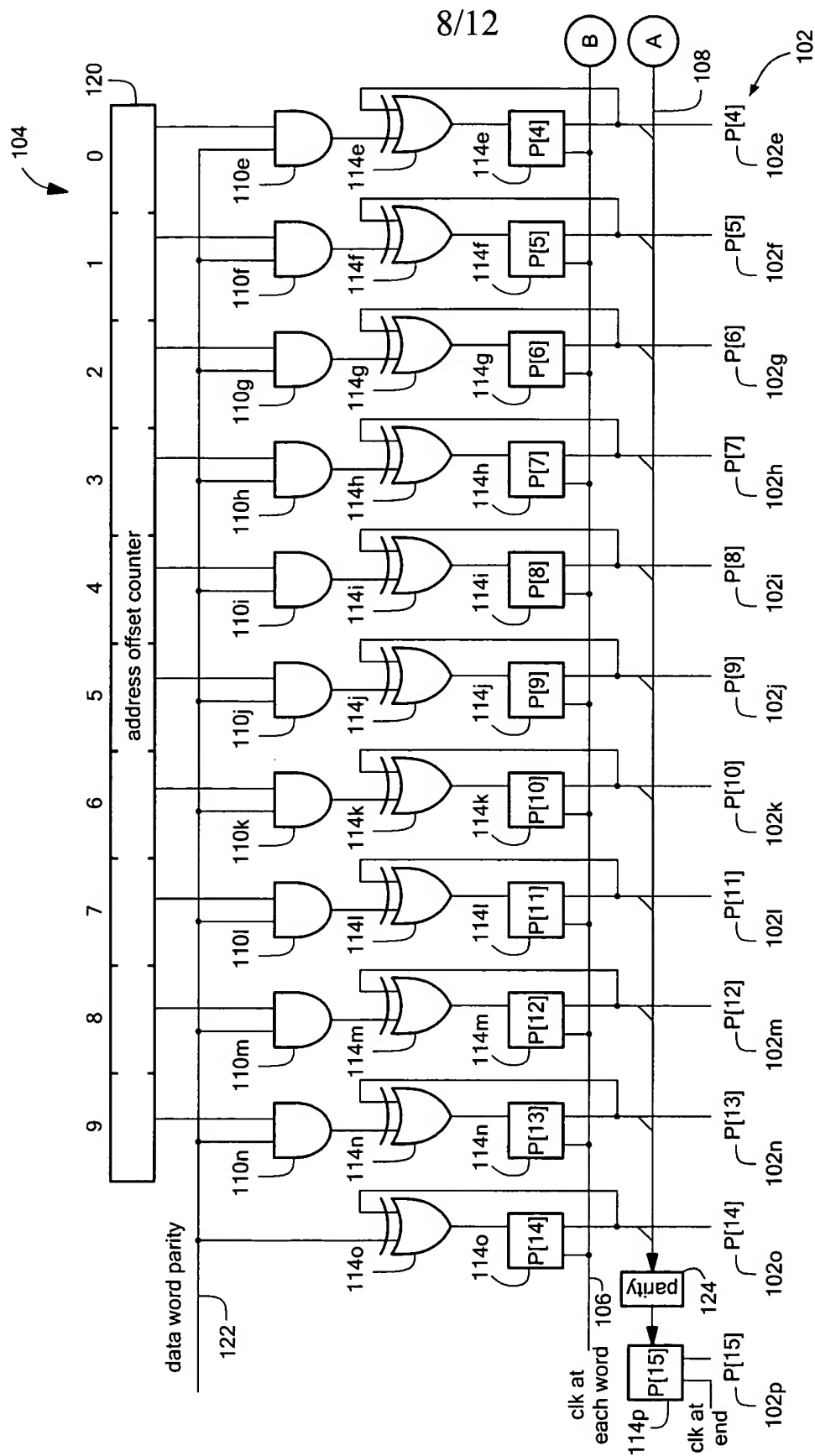


FIG. 9B



SIMPLE ERROR-CORRECTION CODES FOR DATA BUFFERS

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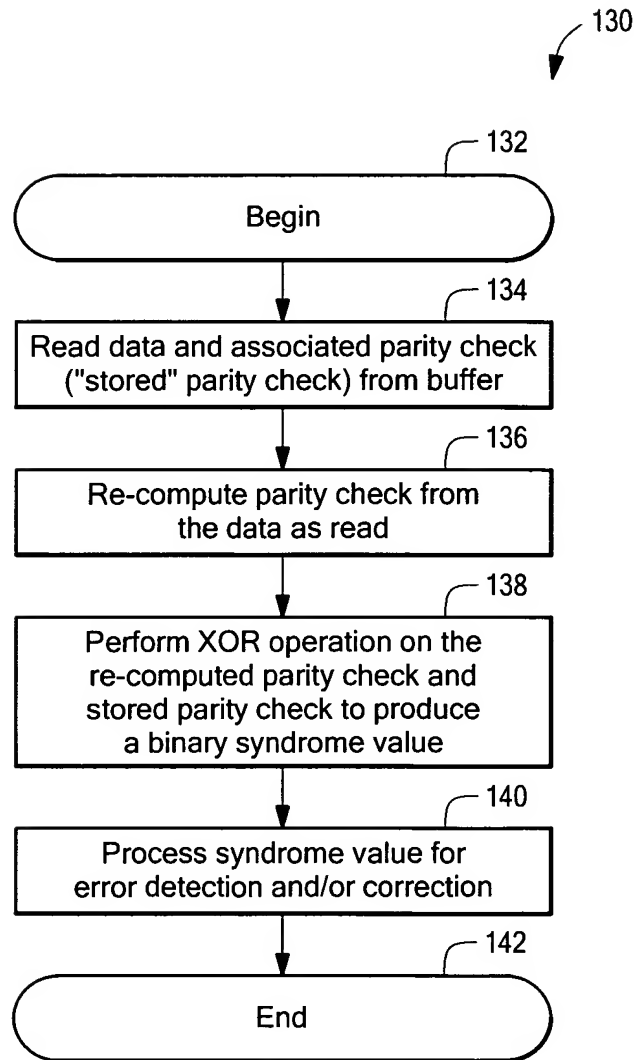


FIG. 10

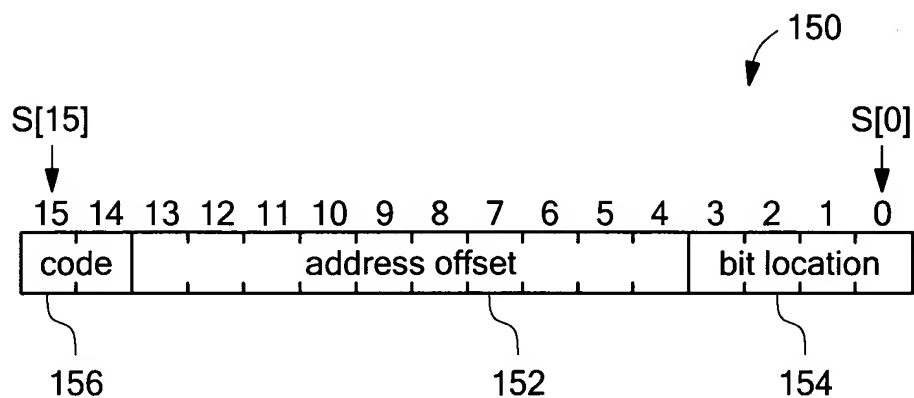
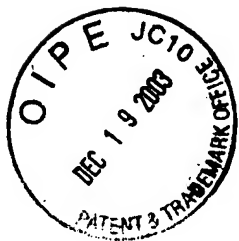


FIG. 11

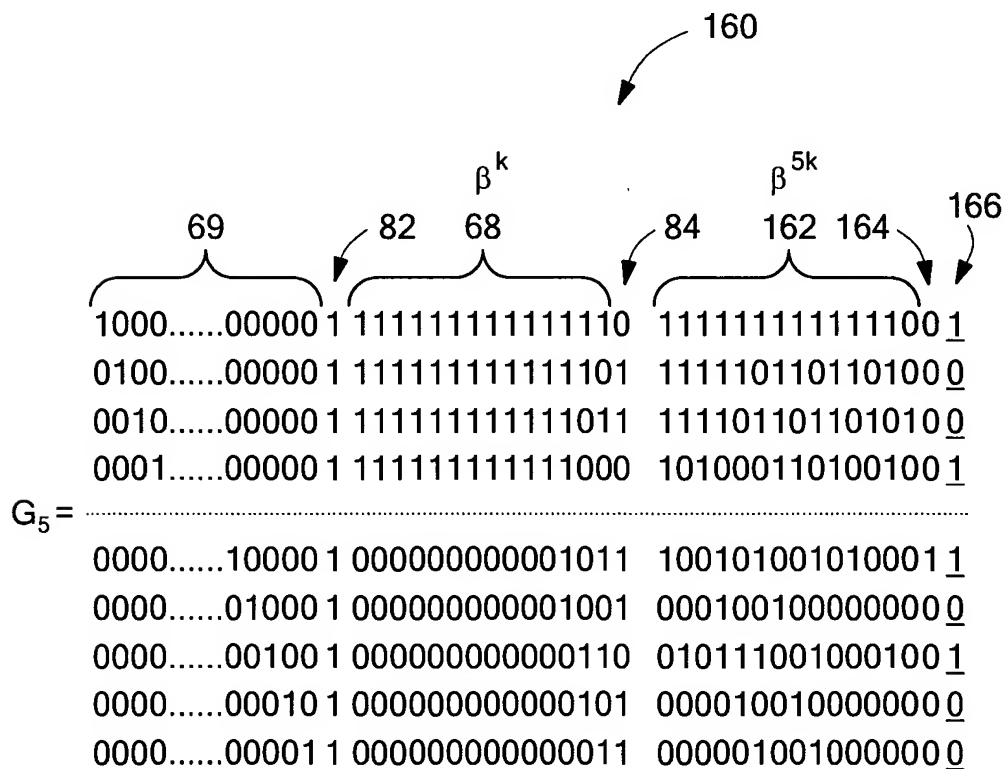
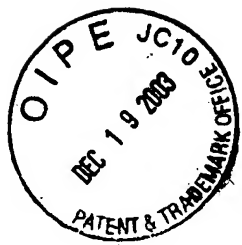


FIG. 12



SIMPLE ERROR-CORRECTION CODES FOR DATA BUFFERS

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unsigned encode()

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```
{  Int M = 14;

  unsigned result;

  unsigned syndrome_x_0, syndrome_x_1, syndrome_x_5;

  int i,j;

  unsigned parity_on_parity;

  unsigned position; // The value of position starts at 1 and ends at 2^14 - 1.

  syndrome_x_0 = 0;

  syndrome_x_1 = 0;

  syndrome_x_5 = 0;

  for(i=0; i < CODE_LENGTH_IN_LONG_WORD; i++) {
    for (j = 0; j < 32; j++)    {
      if(p_temp[i] & (1<<j)) {
        syndrome_x_0^= 1;
        position = (unsigned) i*32 + j + 1;
        syndrome_x_1^= add_parity(position);
        syndrome_x_5^= add_parity(fifth_power(position));
      }
    }
  }

  parity_on_parity = syndrome_x_0^ (syndrome_x_1 & 1) ^ (syndrome_x_5 & 1);
```

result = 0;

result ^= syndrome_x_5 << (30-M); // bits 16 - 30

result ^= syndrome_x_1 << (29-M-M); // bits 1 - 15

result ^= syndrome_x_0 << 1; // bit 31

result ^= parity_on_parity; // bit 0

return(result);

}

FIG. 13

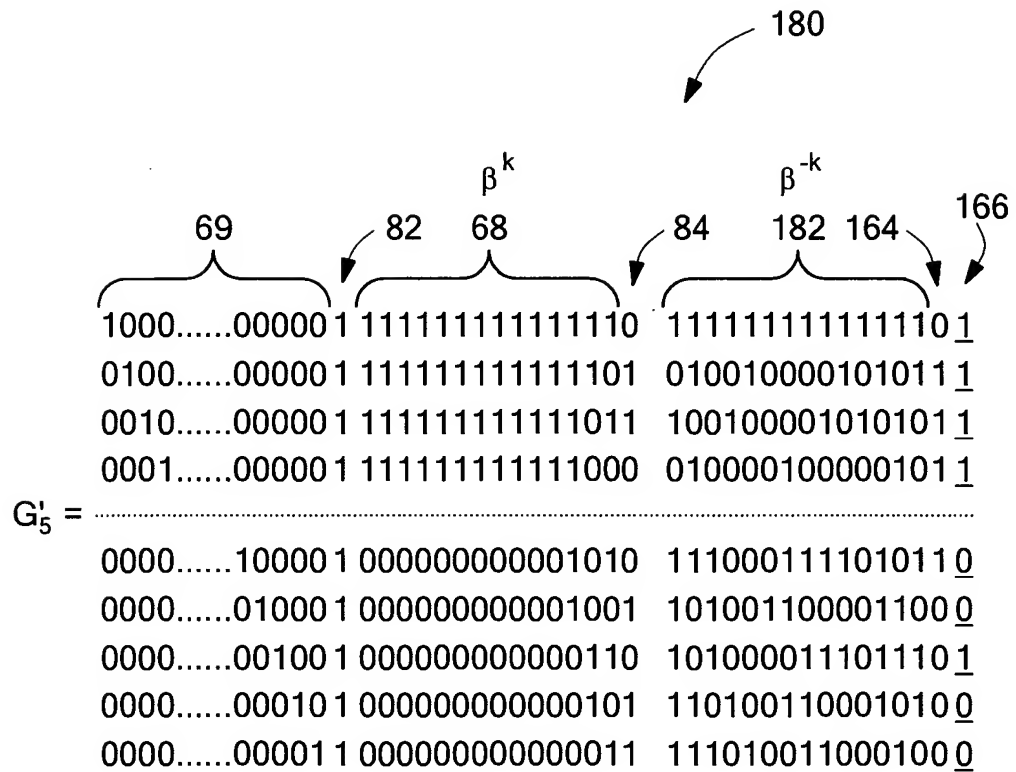


FIG. 14